

**REMARKS**

Claims 2 to 7 are pending in the above-identified application. Claim 2 is independent. Claim 1 has been canceled.

**Claim Rejections – 35 U.S.C. §102**

Claims 2-3 have been rejected under 35 U.S.C. §102(b) as being clearly anticipated by Garland et al. (U.S. Patent 6,204,448, hereinafter Garland). Applicants respectfully traverse this rejection.

Claim 2 is directed to a high-frequency multilayer circuit substrate, which among other things includes a planar impedance matching circuit formed by an impedance matching transmission line, one end of which is connected to the via hole through a via hole metal pad and other end of which is directly connected to the signal transmission line, each of which is located on the same circuit layer. Applicants submit that Garland does not teach or suggest at least that claimed limitation.

The Office Action addresses the limitation of, “a characteristic impedance of a via hole connecting portion formed by the via hole, the via hole metal pad and the planar impedance matching circuit matches a characteristic impedance of the signal transmission line,” in its statement, “a taper and narrow section of signal line (306a)(e.g. see Col. 4, lines 4-14) connects a signal line 306 and the pad to

each other to provide an impedance match everywhere along the signal path length (i.e., the matching inherently includes the signal line, via and matching section)."

The Garland et al. reference states that, "A portion 306a of each lead 306 that passes under the dielectric gap 310 is preferably narrower than other portions of the lead to maintain a predetermined impedance everywhere along its length." In particular, Garland's narrower portion 306a of the lead merely maintains the characteristic impedance of the lead at 50 ohm together with the dielectric gap 310. Garland is not concerned with the impedance of the wire bond pad 305 or impedance of the lead 304.

For example, Garland does not at least suggest that

*impedance of via 304 + lead pad 312 + narrow portion 306a  
is made equal to (i.e., matches)  
impedance of a portion of lead 306 after the narrow portion.*

Therefore, Applicants submit that Garland's statement that the narrow portion 306a is to maintain a predetermined impedance everywhere along the length of the lead 306, does not inherently teach impedance matching between the hole connecting portion and the signal transmission line (based on Garland at column 4, lines 11-14).

Thus, Garland fails to teach or suggest at least the claimed

*"wherein a characteristic impedance of a via hole connecting portion formed by the via hole, the via hole metal pad and the planar impedance matching circuit matches a characteristic impedance of the signal transmission line, the planar impedance matching circuit includes an impedance matching transmission line, one end of which is connected to the via hole through the via hole metal pad and other end of which is directly connected to the signal transmission line, the via hole metal pad, the planar impedance matching circuit and the signal transmission line being located on the same circuit layer"*

The rejection also states that Garland's wire bond pad 305 is on the same layer as the signal line 306. Garland, however, discloses that the wire bond pad 305 is on the other side of the substrate 301 from where the lead 306 is located. The lead 306 is mounted on the pad 312 (Garland, column 3, lines 34-40, and lines 55-57).

Accordingly, for at least these reasons, Applicants respectfully request that the rejection be withdrawn.

**Claim Rejections - 35 U.S.C. §103**

Claims 4 and 5 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Garland, in view of Roberts (U.S. Patent 4,418,429), Hayt, Jr., Engineering Electromagnetics, and Scharfman (U.S. Patent 3,660,784). Applicants respectfully traverse this rejection.

At least for the reasons above for claim 2, Applicants submit that Garland does not teach or suggest all claimed elements of claims 4 and 5, as well. In particular, Roberts, Hayt and Scharfman are relied on for general teachings of impedance matching. Because Garland does not at least teach or suggest impedance matching, but only maintenance of a predetermined impedance, one of ordinary skill in the art would not have been motivated to incorporate the teachings of those other references into Garland in order to arrive at the present claimed invention. In other words, even if Garland, Roberts, Hayt and Scharfman were to be combined, they do not teach the claimed invention.

Thus, at least for this reason the rejections fail to establish *prima facie* obviousness of claims 4 and 5. Accordingly, Applicants respectfully request that the rejection be withdrawn.

Claims 6 and 7 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Garland et al. in view of Scharfman. Applicants respectfully traverse this rejection.

At least for the same reason as above for claim 2, Applicants submit that all claimed elements are not taught or suggested for claims 6 and 7, as well. In particular, Scharfman is relied on for general teachings of impedance matching. Because Garland does not at least teach or suggest impedance matching, but only maintenance of a predetermined impedance, one of ordinary skill in the art would not have been motivated to incorporate the teachings of Scharfman into Garland

in order to arrive at the present claimed invention. In other words, even if Scharfman was to be combined with Garland, they do not teach the claimed invention.

Accordingly, Applicants submit that the rejection fails to establish *prima facie* obviousness for claims 6 and 7. Applicants respectfully request that the rejection be withdrawn.

#### **CONCLUSION**


Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert W. Downs (Reg. No. 48,222) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

**Pursuant to 37 C.F.R. §§1.17 and 1.136(a), Applicants respectfully petition for a one-month extension of time in which to file this reply. Attached is a check for the required fee of \$110.**

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,  
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CG:RWD:kmr  
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